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In this list is to be found every grade of waters, perhaps as large an assortment as those of any state. Contrary to the generally accepted opinion, we have waters of exceptional purity as well as waters that are loaded with sulfates and chlorids almost to saturation. There are not many of the class that contain rare ingredients; or if these are present they are so only in extremely minute quantities. There are many, however, of that other class, namely, those that contain an excess of ordinary ingredients.

Most of the waters that have been examined are in the eastern half of the state, but there are some waters of special interest, like the Great Spirit spring, which are quite a distance west.

The mineral springs properties have been allowed to run down during the recent period of financial depression, and in many places the waters are practically out of use. But the waters are *there*; and, with greater financial prosperity in the state, there is no doubt that many of them will be bought up by capitalists and improved much beyond their former condition. As mineral springs resorts belong to the class known as "luxuries," they are very quick to respond to lack of ready money in the community, especially where they are so far away from the great centers of trade that they cannot draw patronage from the larger cities. They must first have local support, and this they will soon obtain with the increase of money in a community. Baths may be a necessity, but bread is of more importance, and will always be sought first by the people when financially oppressed.

There are indications in several parts of the state that mineral springs will soon again be of greater commercial and medicinal importance. Several new localities have been discovered and considerable money has been expended in improvements.

The analyses above referred to have come from several sources. In addition to the large number that have been carried on in the laboratory of the state university, many have been furnished by the kind coöperation of Professors Failyer and Willard of the agricultural college; Professor Knerr of Atchison; Professor Lovewell of Washburn; Professor Bushong of Emporia College, and others.

A large number of photographs of mineral springs properties has been taken, and a quantity of material collected for publication, which shows that the state has resources in this direction, only partially developed, it is true, but which will add very materially to her commercial wealth and importance.

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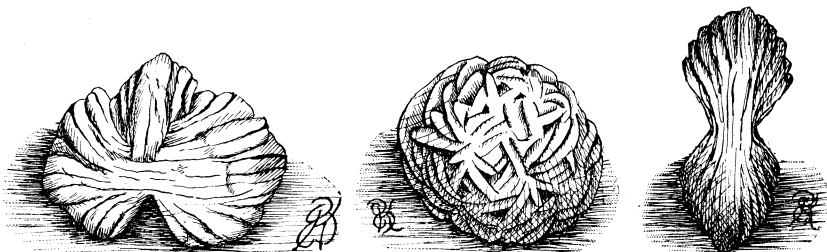
## SILICO BARITE NODULES FROM NEAR SALINA, KAN.

BY E. B. KNERR, ATCHISON.

Read before the Academy December 29, 1898.

I desire to call the Academy's attention to, and present samples for inspection of, some peculiar nodular concretions which were found in the bed of a small stream about six miles east of Salina, Kan. I am informed that these nodules are not at all uncommon in that neighborhood, and possibly the attention of other members of the Academy has been called to them before. I find that the explanations which are locally given accounting for these formations are of interest. One theory is that they are balls of rawhide petrified. The explanation is that at one time there was located in this valley an Indian storehouse of goods, and a large portion of the stock on hand consisted of balls of rawhide. A tornado came along and destroyed the lodge containing the goods, burying its con-

tents in the mud where the balls of hide thongs became petrified in the course of time. No mystery of natural formation in Kansas can be so deep but that it may be thoroughly cleared up, it seems, by the aid of the Indians and a cyclone.



Others explain these concretions by calling them petrified potatoes; but they fail to tell us who planted the potatoes. A chemical analysis of one specimen gave the following results:

|                         |       |           |
|-------------------------|-------|-----------|
| Silicic acid.....       | 43.71 | per cent. |
| Barium sulphate.....    | 46.60 | "         |
| Strontium sulphate..... | 4.20  | "         |
| Aluminum oxide.....     | 5.00  | "         |
| Ferric oxide.....       | .52   | "         |
| Potassium oxide.....    | .20   | "         |

The concretions, therefore, seem to be quartz sands cemented together by barium sulphate admixed with a little strontium sulphate. The specific gravity is 3.36. They vary in size from that of a chestnut to that of a baseball, are somewhat flattened, and are apparently made up of a series of plications.

### CONCRETIONS.

BY E. B. KNERR, ATCHISON.

Read before the Academy December 30, 1898.

A concretion, literally, is a "growing together." Taken in its fullest significance it is, indeed, a very broad term, and we would find classed under this term all assemblages showing symmetry of structure, such as crystals, geodes, nodules, molecules, cells, and even life-forms. In fact, any structure which results from an aggregation of material about a nucleus may properly be called a concretion. Verily, the philosophy wrapped up in the homely proverb, "Birds of a feather flock together," is deep and far-reaching in its import. Could we explain fully the forces at play in the formation of a snowflake, how very much would our knowledge be extended beyond what it is to-day. Could we tell just how and why the water molecules are arranged every time along the hexagonal axes, we would know what the atom is, what the molecule is, what ions are, what the so-called positive and negative electricities are, what chemical affinity is, what gravity is, aye, even what life is.

This may seem to some a broad assertion, but the principles underlying the formation of a water crystal are the same for all crystals and all aggregations of crystals. But the same substances under like conditions always crystallize in the same forms; the structure of the molecule must therefore have something also to do with the crystalline form, and so we must understand the invisible molecule in order that we may fully understand the visible crystal. But again,